

# PATENT ABSTRACTS OF JAPAN

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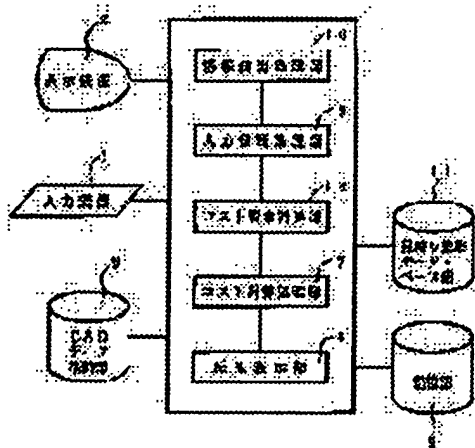
OKI JUNICHI

## (54) DEVICE AND METHOD FOR ESTIMATING COST

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To quickly and simply obtain the production cost of a molding on a design stage by providing a cost estimating device with an estimate reference data base part and a cost element calculating part for calculating each cost element based upon estimate reference data.

**SOLUTION:** A CAD data storing part previously stores two-dimensional CAD shape data or the like of each molding to be calculated at its estimate. An information extracting processing part 10 extracts information necessary for estimate calculation from the CAD shape data, drawing information and so on. An input information processing part 3 receives information or the like which can not be extracted by the processing part 10 from an input processor 1 and processes the information or the like. The estimate reference data base part 11 stores cost factor information by functions of a component. The cost element calculating part 12 calculates each cost element by the use of the data base part 11 based upon the extracted information, input information and so on. A cost calculating processing part 7 mutually adds respective cost elements calculated by the calculating part 12 to calculate the production cost.



## LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

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**JAPANESE** [JP,09-160945,A]

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**CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE  
INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS**

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[Translation done.]

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**CLAIMS**

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[Claim(s)]

[Claim 1] The input unit which accepts alter operation, the display which displays information, and the input processing section which accepts and processes the input from said input unit, In the cost estimated equipment which consists of a display as a result of displaying the cost computation section which calculates a manufacturing cost based on the inputted information, and the processed information on a display Cost estimated equipment characterized by preparing the cost element count section which stored estimated criteria data, and which estimates and calculates each cost element the criteria data base section and based on the estimated criteria data.

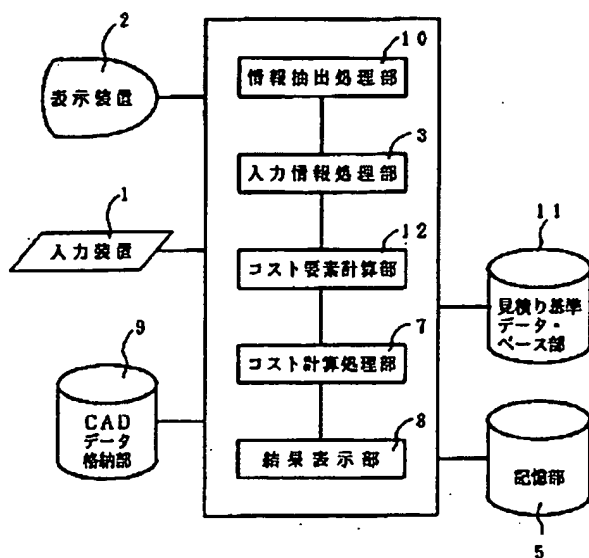
[Claim 2] Cost estimated equipment characterized by preparing the CAD data storage section which stores the CAD data of each part article to manufacture in claim 1, and the information extract processing section which extracts configuration data, notes information, etc. from the CAD data.

[Claim 3] The cost estimated approach characterized by to estimate, to retrieve material information from a material name using a criteria data base, to acquire the specific gravity, the unit price, and the injection-pressure reference value of the material, to determine the making machine for which the estimated criteria data which consist of material information, making machine information, secondary-elaboration information, etc. on mold goods stored, and which uses from the configuration of said injection-pressure reference value and mold goods etc., to retrieve the making machine information about this making machine, to retrieve secondary-elaboration information from the class of secondary elaboration, and to calculate the manufacturing cost of mold goods

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[Translation done.]

Drawing selection [Representative drawing]



実施の形態のコスト見積り装置の構成図

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to cost estimated equipment, and relates to manufacturing-cost estimated equipments, such as a design stage of a product, and mold goods at the time of manufacture design unfinished, and the approach of those especially.

[0002]

[Description of the Prior Art] In recent years, it is in the inclination for the miniaturization of electronic equipment, lightweight-izing, and curve-ization of a design to progress. For this reason, the mark of the mold goods occupied on the total components and a class are increasing mold goods from the point that it is lightweight as compared with metal components, and the point that processing of a curved surface is easy, remarkably. However, while mold goods can process a complicated configuration, they have the difficulty that it is difficult to estimate a manufacturing cost and a person with special knowledge also requires time amount. In order to offer quickly the product for which a user is asked, in the present condition that compaction of design / manufacture period is achieved, the attempt which can compute the manufacturing cost of mold goods in a design stage in a short time is performed. There is cost estimated equipment of the mold goods which used the computer for one of the attempt of the.

[0003] After determining the manufacture approach of mold goods and processing process used as the candidate for estimated to a detail as the technique of estimating the manufacturing cost of mold goods by computer, the cost \*\*\*\* raising method of adding the processing cost for every process is common. Drawing 4 is the block diagram of conventional cost estimated equipment. It has the input unit 1 used for a components entry of data, the input of a processing command, etc., and the display 2 which performs the echo of an input result, and the display of a processing result, it memorizes to the storage section 5 which incorporates and builds in hourly-pay data, working-hours data, etc. of the manufacture approach required for shaping of components, a processing process, and a process from the processing process data-base section 4 by processing of the input processing section 3, and the contents update. A manufacturing cost is calculated by making hourly pay data and working-hours data in the storage section 5 to build in correspond to the manufacture approach inputted in the input processing section 3, or each processing process, computing the cost for every process in the process cost count section 6, and adding them in the cost computation section 7. This count result is expressed to the form of a numerical table in the result display 8, and it displays on a display 2.

[0004] When this technique is used, before carrying out estimated count, it is necessary to determine beforehand the manufacture approach of mold goods and processing process used as the candidate for count. extract the sprue which constitute the passage for pour in a material besides the dimension of components, weight or a volume, and a use material into metal mold in the input processing section 3, a runner, the configuration and the class of the gate, and the number, the class of the undercut used as special processing and the number, and for extract mold goods from metal mold further, and a direction etc. input into a manufacture approach the item concern deeply according to this information determine. It does not leak to these items, and in order to prepare and input information, it is necessary to complete

a design so that it can determine to the processing process of mold goods.

[0005] Moreover, in order to concern input with altitude at manufacture, the operator who has the know how well versed in mold-goods manufacture is required for it. For this reason, in case cost is estimated for economical evaluation in the middle of the design of mold goods, the manufacture related information which is needed for count is arranged, and by the time it obtains an estimated count result, time amount and a help will be spent very much.

[0006]

[Problem(s) to be Solved by the Invention] As stated above, by conventional cost estimated equipment and its approach of estimating, it takes the time and effort which inputs the dimension value of \*\* mold goods, configuration information, a use material, etc. with a help.

\*\* A full-time person with the knowledge which can determine the manufacture approach of mold goods and a processing process is required.

[0007] \*\* There are many input items and an input procedure is complicated.

\*\* In order to determine an input item, the design of mold goods needs to be completed.

There is a fault to say and there was no mold-goods cost estimated equipment which can obtain the manufacturing cost of mold goods by the design stage quickly and simply.

[0008]

[Means for Solving the Problem] The input unit with which this invention accepts alter operation, and the display which displays information, The input processing section which accepts and processes the input from an input unit, and the cost computation section which calculates a manufacturing cost based on the inputted information, In the cost estimated equipment which consists of a display as a result of displaying the processed information on a display, and its approach of estimating It is characterized by preparing the cost element count section which stored estimated criteria data and which estimates and calculates each cost element the criteria data base section and based on the estimated criteria data.

[0009]

[Embodiment of the Invention] Drawing is used for below and the gestalt of operation of this invention is explained to it. Drawing 1 is the block diagram of the cost estimated equipment of the gestalt of operation. In drawing, 1 is data and an input device for an input of a processing command, for example, consists of a keyboard, various pointing devices, etc. 2 shows the indicating equipment which performs the echo of an input result, and the display of a processing result, for example, consists of CRT, a liquid crystal display, etc.

[0010] 9 is the CAD data storage section and is for memorizing the two-dimensional CAD configuration data of the mold goods used as the candidate for estimated count etc. 10 shows the information extract processing section, estimates it from CAD configuration data, drawing information, etc., and extracts information required for count. 3 is the input processing section, and accepts and processes the information which was not able to be extracted in the information extract processing section 10 from an input unit 1.

[0011] 5 is the storage section and memorizes data required for processing suitably. 11 is the estimated criteria data base section, and stores the information on the cost factor of the functional order of components. 12 is the cost element count section, is estimated based on above-mentioned extract information, above-mentioned input, etc., and calculates a cost element using the criteria data base section 11.

[0012] 7 is the cost computation section, and it calculates a manufacturing cost by adding the cost element computed in the cost element count section 12. This count result is expressed to the form of a numerical table etc. in the result display 8, and it displays on a display 2. Drawing 2 is the explanatory view showing an example of estimated criteria data, and explains the estimated criteria data stored in the above-mentioned estimated criteria data base 11 by this drawing.

[0013] There are material information, making machine information, secondary elaboration information, etc. in estimated criteria data. Material information is the information about the ingredient of mold goods, and is a data constellation which consists of a material name, specific gravity, an injection-pressure reference value, etc. Making machine information is the information about the making machine

into which a material is processed, and is a data constellation which consists of an injection pressure, standard sprue / runner weight, a working limit dimension, hourly pay, standard cycle time, standard set time amount, standard set loss weight, a miscellaneous-expenses multiplier, etc.

[0014] Secondary elaboration information is the information about the secondary elaboration performed after processing by the making machine etc., and is a data constellation which consists of the processing name which shows the class of secondary elaboration, a unit price, standard floor to floor time, hourly pay, etc. Drawing 3 is the flow chart of the gestalt of operation, and explains actuation of this equipment of the above-mentioned configuration using this drawing.

[0015] 1st step-information extract processing S1: When the two-dimensional CAD data of mold goods exist, processing is advanced to S2, and in not existing, it advances processing to S7.

S2 : The information extract processing section 10 estimates, and extracts and acquires information required for count from the two-dimensional CAD data which were taken out from the CAD data storage section 9, and were memorized by the storage section 5.

[0016] S3 : Graphic form data element's existence distribution is computed, fields, such as a front view, a right side view, a left side view, a plan, a bottom view, and rear view, are computed, and the graphic element belonging to each plane of projection is obtained.

S4: It estimates from the coordinate value of the graphic element in each plane of projection, the dimension value of the height of the solid configuration of the mold goods which are the candidates for count in every direction is acquired, and the projected area to each of that plane of projection is calculated.

[0017] S5 : When title block information, notes, etc. are included in two-dimensional CAD configuration data, processing is advanced to S6, and when those information is not included, processing is advanced to S7.

S6 : Information, such as a use material name, a secondary elaboration name, and its number, is extracted out of the above-mentioned title block information, notes, etc. Processing progresses to S7.

2nd step-input processing S7: Although it is required for estimated count, the input processing section 3 accepts and processes the input of the information item which was not able to be extracted in the 1st above-mentioned step. Input unit 1 grade performs this alter operation.

[0018] 3rd step-cost element count S8: In the cost element count section 12, it stores in the storage section 5 which acquires and builds in specific gravity, a unit price, an injection-pressure reference value, etc. from the material information in the estimated criteria data base section 11 by using the material name which was obtained in the above 1st and the 2nd step and to be used as a search key.

S9: An injection pressure is determined from the data stored in the above-mentioned storage section 5.

[0019] S10 : The information which determined the proper making machine used, retrieved the making machine information in the estimated criteria data base section 11 by having made this into the search key, and was acquired from said injection-pressure value, dimension value of the solid configuration of mold goods, etc. is stored in the storage section 5. Moreover, also about secondary elaboration, a secondary elaboration name is estimated as a search key, the secondary elaboration information in the criteria data base 11 is acquired, and it stores in the storage section 5.

[0020] S11 : Each cost element, such as the cost of materials and a conversion cost, is calculated using the formula determined beforehand using each information stored in the storage section 5. For example, when computing the cost of materials, multiply the volume of a product by specific gravity and it considers as product weight. Apply the sprue / runner weight obtained from making machine information by this, and it considers as AUW. The costs which correspond from the unit price of this AUW, the number, and an ingredient etc. are computed, the costs for a set loss are computed from the set loss weight further produced in case a making machine is set, and the unit price of an ingredient, and the cost of materials is computed by adding the costs concerning these ingredients.

[0021] In addition, more exact computation becomes possible by fewer input by utilizing the statistical information based on the cost information in the case of old making machine employment etc.

S12 : Miscellaneous expenses other than each above-mentioned element are computed.

4th step-cost computation S13: In the cost computation section 7, cost elements computed in the 3rd



step, such as the cost of materials and a conversion cost, are added, and a manufacturing cost is calculated.

[0022] It is display S14 as a result of 5th step-. : In the result display 8, each computed cost element, such as the cost of materials and a conversion cost, the manufacturing cost as the sum total, the material name used for count, a unit price, the making machine used, etc. are displayed on a display 2 like \*\*\*\*. As shown in the gestalt of this above-mentioned operation, when estimating without determining the manufacture approach and a processing process beforehand and becoming calculable, in order to estimate many of information required for count and for equipment itself to extract from two-dimensional CAD configuration data, inputting with a help becomes unnecessary, looking at a drawing. Thus, by realizing a deployment of CAD data, while working hours are shortened, the incidence rate of a mistake decreases.

[0023] Moreover, since the information which equipment needs is an item based on not the information for which it depends on the manufacture approach or a processing process deeply but the functional information which mold-goods components have, even if it is not the operator who has the know how well versed in manufacture or a processing process, estimated count is possible for it and dispersion in the calculation result by each operator's individual difference of it is lost. From these things, in the initial stage of a design, economical evaluation is attained in parallel with the functional design of components, and compaction of the period from a design to a prototype and manufacture and improvement in effectiveness are realized.

[0024] In addition, although the gestalt of above-mentioned operation gives and explains the example of the manufacturing-cost estimate of mold goods, this is making making machine information in an estimated criteria data base into the information which uses NC machine as a search key, and can apply this invention as cost estimated equipment of sheet-metal components and others.

[0025]

[Effect of the Invention] As explained to the detail above, it has the effectiveness whose estimated count simple and quick in the phase before determining the manufacture approach and a processing process is attained by having prepared the estimated criteria data base section and the cost element count section. Moreover, by having prepared the CAD data storage section and the information extract processing section, CAD data are used effectively, information required for count can be automatically extracted now, and there is effectiveness which compaction of working hours and reduction of a mistake realize.

[0026] Furthermore, in the initial stage of a design, economical evaluation is attained in parallel with the functional design of components, and it has the effectiveness which compaction of the period from a design to a prototype and manufacture and improvement in effectiveness realize.

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**TECHNICAL FIELD**

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**PRIOR ART**

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[0005] Moreover, in order to concern input with altitude at manufacture, the operator who has the know how well versed in mold-goods manufacture is required for it. For this reason, in case cost is estimated for economical evaluation in the middle of the design of mold goods, the manufacture related information which is needed for count is arranged, and by the time it obtains an estimated count result, time amount and a help will be spent very much.

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**EFFECT OF THE INVENTION**

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**TECHNICAL PROBLEM**

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\*\* A full-time person with the knowledge which can determine the manufacture approach of mold goods and a processing process is required.

[0007] \*\* There are many input items and an input procedure is complicated.

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**DESCRIPTION OF DRAWINGS**

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[Brief Description of the Drawings]

[Drawing 1] The block diagram of the cost estimated equipment of the gestalt of operation

[Drawing 2] The explanatory view showing an example of estimated criteria data

[Drawing 3] The flow chart of the gestalt of operation

[Drawing 4] The block diagram of conventional cost estimated equipment

[Description of Notations]

1 Input Unit

2 Display

3 Input Processing Section

7 Cost Computation Section

8 Result Display

9 CAD Data Storage Section

10 Information Extract Processing Section

11 Estimated Criteria Data Base Section

12 Cost Element Count Section

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## DRAWINGS

## [Drawing 2]

## 素材情報

素材名称、比重、単価、射出圧力基準値

## 成形機情報

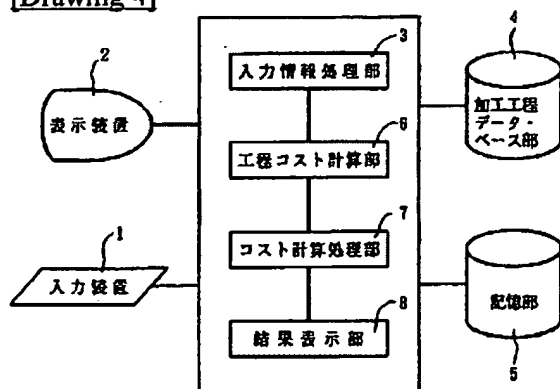
射出圧力、標準スプルー/ランナー重量、加工限界寸法  
時給、標準成形時間、標準セット時間  
標準セットロス重量、経費係数

## 2次加工情報

加工名称、単価、標準加工時間、時給

見積り基準データの一例を示す説明図

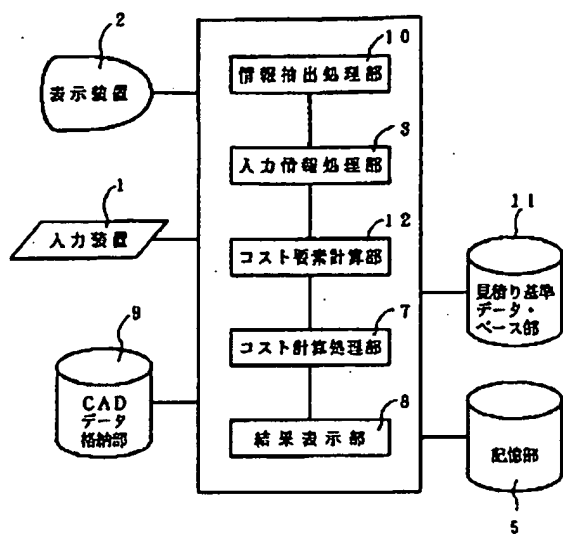
## [Drawing 4]



従来のコスト見積り装置の構成図

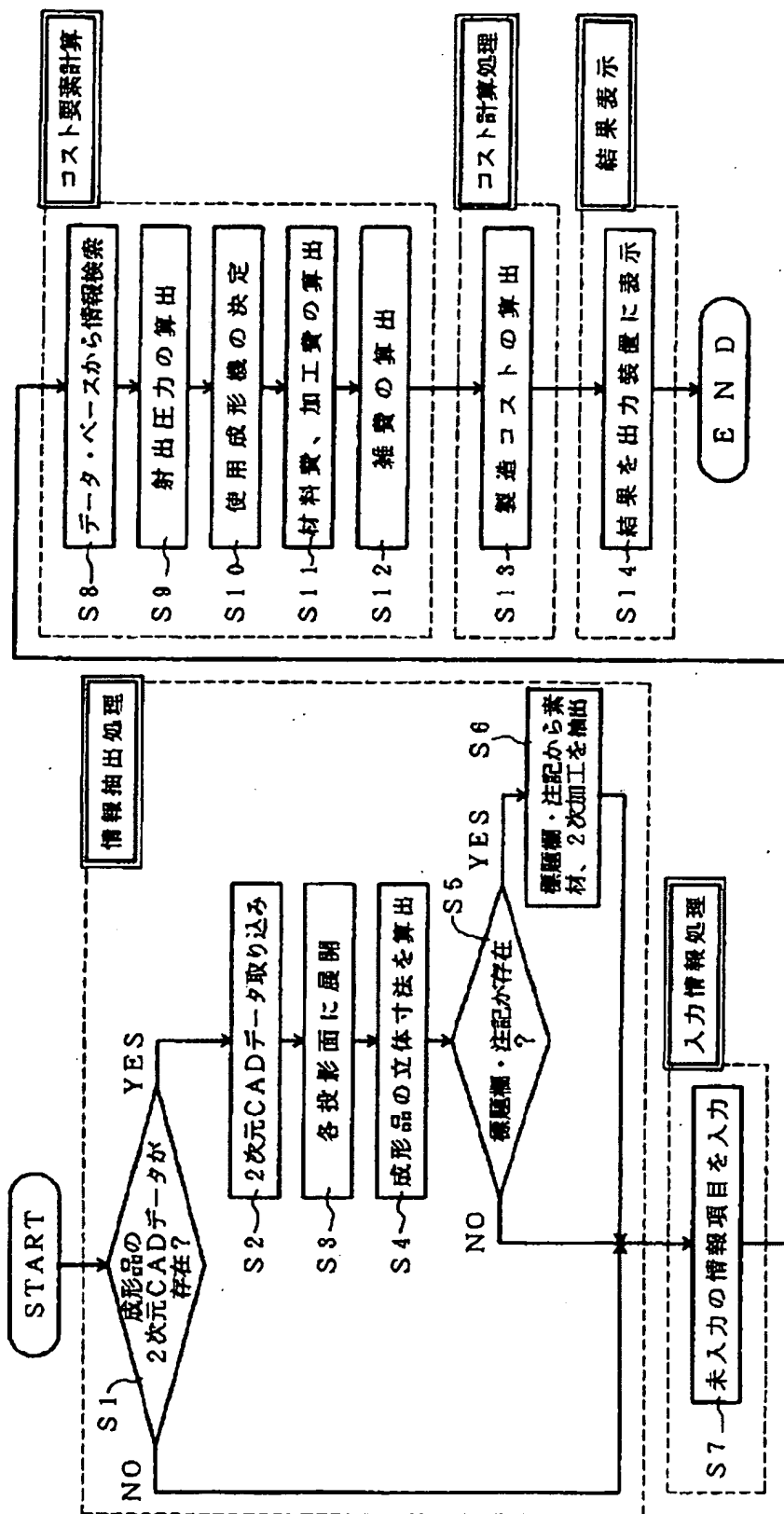
## [Drawing 1]





実施の形態のコスト見積り装置の構成図

[Drawing 3]



実施の形態のフローチャート

[Translation done.]